UTILIZATION OF NON-PNEUMATIC ANTI-SHOCK GARMENT AND ASSOCIATED FACTORS FOR POSTPARTUM HEMORRHAGE MANAGEMENT AMONG HEALTH CARE PROFESSIONALS' IN PUBLIC HOSPITALS OF JIMMA ZONE, SOUTH-WEST ETHIOPIA

BY:- GEMECHU TEREFE (BSc)

RESEARCH THESIS SUBMITTED TO SCHOOL OF NURSING AND MIDWIFERY, FACULTY OF HEALTH SCIENCE, INSTITUTE OF HEALTH, AND JIMMA UNIVERSITY FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENT OF THE DEGREE OF MASTERS SCIENCE IN MATERNITY NURSING.

JUNE, 2019

JIMMA, ETHIOPIA

JIMMA UNIVERSITY

INSTITUTE OF HEALTH, FACULTY OF HEALTH SCIENCE

SCHOOL OF NURSING AND MIDWIFERY

UTILIZATION OF NON-PNEUMATIC ANTI-SHOCK GARMENT AND ASSOCIATED FACTORS FOR POSTPARTUM HEMORRHAGE MANAGEMENT AMONG HEALTH CARE PROFESSIONALS' IN PUBLIC HOSPITALS OF JIMMA ZONE, SOUTH-WEST ETHIOPIA.

BY: GEMECHU TEREFE (BSc)

ADVISORS:- 1.Mrs. MAKEDA SINAGA (BSc, MSc/RH, ASS'T PROFESSOR)

2.Mr. GADISA BEKELE (BSc, MSc)

JUNE, 2019

JIMMA ETHIOPIA

ABSTRACT

Background: *Non- pneumatic Anti-Shock Garment is a unique, life -saving first -aid device made of neoprene and velcro, which is used for treatment of women with postpartum hemorrhage. It can be applied by anyone, even those without medical training. Maternal mortality in the world still very high and postpartum hemorrhage is the leading cause of maternal mortality worldwide.*

Objective*: To assess utilization of non-pneumatic anti-shock garment and associated factors for postpartum hemorrhage management among health care professionals working in public hospitals of Jimma zone, South-West Ethiopia, 2019.*

Methods: *Facility based cross-sectional studies design both quantitative and qualitative data collection methods were employed among 210 health care professionals and 10 key informants respectively. Data was collected by pretested semi-structured self-administered questionnaire and qualitative data was addressed by in-depth interview. The collected data were checked, coded and entered into Epi-data version 3.1 and exported to SPSS version 23 for analysis. Bivariable and multivariable logistic regression was done to identify factors associated with non-pneumatic anti-shock garment utilization. Qualitative data was transcribed, translated and triangulated with quantitative findings.*

Results: *Seventy six (36.2%) of the respondents used non-pneumatic anti-shock garment in their hospitals for management of post-partum hemorrhage. Having good knowledge (AOR= 3.96, 95% CI:(1.67, 9.407)]. , having positive attitude [(AOR= 3.54, 95% CI:(1.37, 9.13)]. , attending training [AOR=13.156, 95% CI :(4.81, 36.00], having two and above non-pneumatic anti-shock garment at their hospitals [AOR=8.7, 95% CI :(2.89, 26.20)] were significantly associated with utilization of non-pneumatic anti-shock garment.*

Conclusion and Recommendation: *The utilization of non-pneumatic anti-shock garment for the management of postpartum hemorrhage was 36.2%. The identified factors that significantly associated with utilization of Non-pneumatic anti-shock garment were good knowledge, positive attitude, attend training and more number of non-pneumatic anti-shock garments. The health care professionals that involved in the maternity service should be trained on how to use this important garment in the management of postpartum hemorrhage.*

Key words: *utilization; non-pneumatic anti shock garment; maternal mortality; postpartum hemorrhage.*

Acknowledgement

First and foremost, I owe this achievement to God for strengthening me. It has been my faith that has been guided me in all way here.

My heartfelt appreciation and thanks goes to my advisors Mrs.Makeda Sinaga and Mr. Gadisa Bekele for their unreserved advice and support throughout all the processes in the development of this research project.

Similarly I would like to thank Jimma University, Institute of Health, post graduate coordinating office for all its supports including funding the required budget as well the provision of ethical clearance to carry out this research project.

My deepest gratitude also goes to the data collectors, Supervisors and respondents without whom this thesis would not have been realized.

At last but not the least, I would like to thank my beloved friends for their valuable comments & support during preparation of this research project.

Table of contents

Contents

List of tables

Figures

Acronyms and Abbreviation

AMTSL …… Active Third Stage Management
AOR …… Adjusted Odd Ratio
BMI …… …Body Mass Index
Bpm …… …Beat per minute
CHAI …… …Clinton Health Access Initiative
COR …… …Crude Odd Ratio
EAOs …… …Extreme adverse outcome
FIGO…… …Federation of Gynecology and Obstetric
HCP…….Health Care Professionals
ICM …… …International Confederation of Midwives
JMC …… …Jimma Medical Center
MW…… …Midwives
NASA …… National Aeronautics and Space Administration
NASG…… …Non-pneumatic Anti-Shock Garment
OH …… ……Obstetric Hemorrhage
PASG …… …Pneumatic Anti-shock garment
PPH…… …postpartum Hemorrhage
SI …… …Shock Index
SSA …… …Sub Sahara Africa
US …… …United State
WHO …… …world Health Organization

CHAPTER ONE- INTRODUCTION

1.1 Background

Non- pneumatic Anti-Shock Garment (NASG) is a unique, life -saving first -aid device made of neoprene and velcro, which is used for women with obstetric hemorrhage. It can be applied by anyone, even those without medical training. Non-pneumatic anti-shock garment has a unique role in hemorrhage and shock management because it is meant to be used with, other technologies. Currently, it is the only tool first aids in stabilizing pulse and blood pressure after a woman has gone into shock from obstetric hemorrhage. Non-pneumatic anti-shock garment can reverse shock and can be used at the same time with other hemorrhage and shock treatments, such as: uterine massage, uterotonics, blood transfusions, vaginal procedures and surgery, uterine balloon tamponade(1, 2).

The Non-pneumatic anti-shock garment was developed in 1970s by the United States (US) National Aeronautics and Space Administration (NASA)/ Ames; the original patent has expired. Although it has been used in the US for pre-hospital lower body trauma, the device was not used for obstetric hemorrhage in limited-resource settings until 2002(3).

Non-pneumatic anti-shock garment decreases blood loss by increasing the resistive index in the internal iliac and uterine arteries, which indicates decreased blood flow through these vessels, NASG increases both external and internal abdominal pressure; preliminary data suggest that the amount of increase in intra-abdominal pressure is 10–20 mmHg and there may be variability in effectiveness of the non-pneumatic anti-shock garment depending on individual patient characteristics such as abdominal circumference(4).

The non-pneumatic anti-shock garments like bottom half suit and consists of three pairs the first of segments, the first segments are placed around the patient's legs and the second three segments are placed around her pelvis and abdomen during the application for postpartum hemorrhage. A ball in segment 5 is placed over the woman's umbilicus (belly button, navel), adding more pressure. Non-pneumatic anti-shock garment is to be worn until the patient's vital sign have stabilized for 2 hours or more, include blood loss < 50 ml/hr, pulse <100 bpm and systolic blood pressure >100 mmhg. Removing of NASG begins from lowest segments and proceeds upward by allowing 15 minutes between removals each segment for redistribution of blood. But if her hemodynamic status has not become unstable use the **"**Rule of **20**", that means

her pulse has not increased by more than 20 bpm and her systolic blood pressure has not decreased by more than 20 mmHg. If pulse and blood pressure remain stable, open the next segment pair (5).

In 2003 the International Confederation of Midwives (ICM) and the International Federation of Gynecology and Obstetrics (FIGO) recommended the non-pneumatic anti-shock garments to reduce mortality among women suffering from postpartum hemorrhage(6). In 2012 world health organization introduced non-pneumatic anti-shock garment as one protocol of postpartum hemorrhage management (7).

In 2011 Non-pneumatic anti-shock garment introduced in Ethiopia by Clinton Health Access Initiative (CHAI) as a pilot project to prevent postpartum hemorrhage as first in Oromia and Tigray regions. Based on the findings, the Federal Ministry of Health has distributed to other regions and federal referral hospitals (8).

Therefore, the utilization of the NASG is capable of reversing the hemorrhagic shock and can stabilize a patient while during delays in receiving care at health facilities, receiving definitive care. Non-pneumatic anti-shock garment has presently been used for women with postpartum hemorrhage from all etiology in many low-resource referral facilities.

1.2 Statement of problem

Maternal mortality is the death of a woman during pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or provoked by the pregnancy but not from accidental or incidental causes" (9). The death of a woman in childbirth or from pregnancy-related events is a devastating experience for the woman's family, her partner and her surviving children and is also devastating for all involved in her care (10**)**.

The maternal mortality ratio in developing countries in 2015 is 239 per 100 000 live births versus 12 per 100 000 live births in developed countries (11). Maternal mortality rate in Africa is the highest, and it is estimated at 500 deaths per 100, 000 live births. Fifty six percent (56%) occur in sub-Saharan Africa a region that accounts for only 21% of the world population (12).In Ethiopia, maternal mortality still high. According to the World Bank report of 2018 the Ethiopian maternal mortality was 353 per 100, 0000 live birth (13).

Postpartum hemorrhage is one of the leading causes of maternal mortality and morbidity, accounted for approximately 27% of global maternal deaths, is defined as vaginal bleeding more than 500 ml after vaginal delivery, blood loss of more than 1000 ml after cesarean delivery and more than 1500 ml after cesarean hysterectomy (14).

In 2014 globally over 661 000(27.1%) maternal death was occurred due obstetric hemorrhage. More than two thirds of reported hemorrhage deaths were classified as postpartum hemorrhage. About 19.7% was occurred in developing countries. Eastern Asia accounted about 26.1% and in Sub-Saharan Africa around 200,000 maternal deaths was caused by postpartum hemorrhage (15). According to the study conducted in Jimma University specialized hospital on the trend of maternal death from 2010 to 2014 most of maternal maternal deaths occurred because of direct obstetric causes. Hemorrhage was the leading cause of death accounted about 54% in every year of the study, and it is the cause for more than half this death was occurred due to postpartum hemorrhage especially between 4 and 7 days of postpartum (16).

In addition to its direct cause of maternal of death, postpartum hemorrhage has also short and long term impacts like chronic illness, disability, increasing of death, poor growth and development of their children, hepatic dysfunction (17).

A woman suffering from hypovelimic shock secondary to postpartum hemorrhage can die within 2 hours except she receives immediate blood transfusion and appropriate emergency obstetric care (18).

Non-pneumatic anti-shock garment is one of the first management tools for hypovolemic shock secondary to obstetric hemorrhage that is helpful in resuscitating and sustaining women in severe obstetric hemorrhagic shock. There was neither mortality nor clinically significant morbidity in this reappraisal so with out of this advice maternal mortality and morbidity very high (19).

The study conducted on the non-pneumatic anti-shock garment at Global Health study showed that with help of the non-pneumatic anti-shock garment for postpartum hemorrhage management blood loss decreased by 42-55%, vital signs and restoration of circulatory stabilized rapidly, maternal mortality was reduced by 66%, morbidity decreased by 44-66% and there were 32-73% lower extreme adverse outcomes (EAOs) (20). At referral, tertiary-level facilities using non-pneumatic anti-shock garment for the management of postpartum hemorrhage reduce maternal mortality by 48 %(21).

Study done in Ibadan Nigeria in 2014 utilization of non-pneumatic anti-shock garment for the management of post partum hemorrhage was low, which was only 14.5 %(22).

Low utilization of non-pneumatic anti-shock garment in Bayelsa State in which 46.4% of Midwives used for the management of postpartum hemorrhage this indicated low utilization of non-pneumatic anti-shock garment among respondents despite the efficacy of non-pneumatic anti-shock garment in reducing maternal morbidity and mortality related postpartum hemorrhage-related complication (23).

However, regardless of effective and many benefits associated with the use of Non-Pneumatic Anti shock garment in the management of postpartum hemorrhage its utilization is still very low. Even in Ethiopia still there is no any study showed utilization of non-pneumatic anti-shock garment for the management of postpartum hemorrhage by health care professionals. This study was therefore designed to assess health care professional utilization of non-pneumatic anti-shock garment and associated factors for the management of postpartum hemorrhage in Public hospitals of Jimma Zone South West Ethiopia.

CHAPTER TWO-LITERATURE REVIEW

The non pneumatic anti-shock garment a low-technology first-aid device has been shown to decrease blood loss and mortality among women experiencing hypovolemic shock secondary to obstetric hemorrhage (3).

Non-pneumatic Anti-shock garment utilization

In Ondo State, quantitative cross-sectional study conducted among 177 Midwives in 2017 has revealed that the utilization of non-pneumatic anti-shock garment for the management of postpartum hemorrhage was very low which 25 (14.1%) Midwives utilized. Fifty four (30.5%) of the respondents attend training on non-pneumatic utilization. For about 35% of very low utilization was due to none availability of garment and 3.4% didn't aware the existence of non-pneumatic anti-shock garment, effective management of 3rd stage of labour(0.6%), the garment is not convenient(1.7%) , not aware of the garment existence(3.4%) (22).

In University College Hospital, Ibadan a cross sectional study design done among 100 Midwives in October 2014 on the assessment o knowledge and utilization of anti-shock garment in the prevention of postpartum hemorrhage shock revealed that from this study was the utilization of non-pneumatic anti-shock garment that 35% of Midwives utilize non-pneumatic anti-shock garment for the management of postpartum hemorrhage (24).

A quantitative descriptive cross-sectional survey conducted in Sokoto state Specialist Hospital among 100 health care professionals' by census sampling technique to determine the respondents knowledge and utilization of non-pneumatic anti-shock Garment in Prevention of Postpartum Hemorrhagic shock revealed that 35% health care professionals utilized for the management of postpartum hemorrhage non-pneumatic anti-shock garment (25).

In Central Hospital Benin City, cross-sectional study conducted among 150 Midwives on knowledge and use of anti-shock garment revealed that Sixty three (42%) of Midwives were used non-pneumatic anti-shock garment for postpartum hemorrhage management (26).

A quantitative cross-sectional study conducted among 112 Midwives in Bayelsa State Nigeria in 2015 revealed that the utilization of non-pneumatic of anti-shock garment among the respondents was 46.4% for postpartum hemorrhage management; however, all of these never used non-pneumatic anti-shock garment when every there is postpartum hemorrhage. From this about 20% participants used when other methods fail, 16.1% used when women already in shock and the rest was used when sever postpartum hemorrhage presented (23).

A descriptive cross-sectional design conducted among 177 Midwives Hospitals of Ondo state of Nigeria in 2015 to assess knowledge and attitude towards PPH control using anti shock garment revealed that 118(66.67%) of the respondents had awareness of Non-pneumatic anti-shock garment and 48.6% heard first during took training and 10(5.6%) from printed materials. About 45.8% had good knowledge on NASG and less than half (40.7%) of the respondents had positive attitude towards non-pneumatic anti-shock garment utilization (27).

Factors associated with non-pneumatic anti-shock garment utilization

A quantitative cross-sectional study conducted on knowledge and utilization of NASG among 150 Midwives revealed that there was significant association between the respondents' knowledge and their utilization of non-pneumatic anti-shock garment for the management of postpartum hemorrhage with p value less than 0.05(26).

Cross-sectionals among 177 Midwives Hospitals of Ondo state of Nigeria in 2015 to assess knowledge and attitude towards revealed that there was significant association between midwives knowledge of non-pneumatic anti- shock garment and their utilization with p- value less than 0.05. However there was no significant association between midwives attitudes and with availability (number) of the NASG and its utilization their utilization of non-pneumatic anti-shock garment for postpartum hemorrhage management with p- value >0.05. And also the study revealed that there was no statically significant association between years of work experiences of Midwives towards non-pneumatic anti-shock utilization ((X2 = 8.577, P = 0.114) (27).

However, a descriptive cross-sectional design study conducted among 112 Midwives in Bayelsa State Nigeria in 2015 revealed that there was was no statically significant association between the knowledge of respondent and their utilization of non-pneumatic anti-shock garment as well as between years of working experience and their utilization of non-pneumatic anti-shock garment with p-value (X2 = 0.387, , P = 0.534)(23).

According to study in Nepal 2014, on utilization of NASG for the management of postpartum hemorrhage among Midwives revealed that about 33.3% of the Midwives t had training on the utilization of Non-Pneumatic Anti-Shock Garment. It showed that having training on NASG can influence the utilization of NASG(28).

As a summary, using of Non-pneumatic anti-shock garment is key role for saving the life of mother suffering from postpartum hemorrhage complication. However, in the previous studies

the factors that influencing the utilization of non-pneumatic anti-shock garment didn’t well identified and some variables didn’t include. So this research aims to contribute in closing these gaps.

2.2. Significance of the study

Using greatest effort to ensure complication-free maternal service as much as possible is one of the focus areas of the Ethiopian government.

Therefore, findings from this study were useful; by providing information to, administrators of governmental hospitals of the study area, Jimma Zone and Jimma city health bureaus. This would help to improve the utilization of non-pneumatic anti-shock garment for postpartum hemorrhage management of health care professionals' and it would ultimately benefit consumers of postpartum haemorrhage management service from health care professionals' in government hospitals of the study area.

In addition to the above points, it would help researchers by being additional literature if they are interested in conducting research on the issue under consideration.

Conceptual Frame work

This conceptual frame work constructed after thorough review of different literatures and developed by adding other variables related to topic. It has three main factors:Personal factors, socio-demographic factors, organizational factors which may influence the utilization of Non-pneumatic anti-shock garments(NASG).

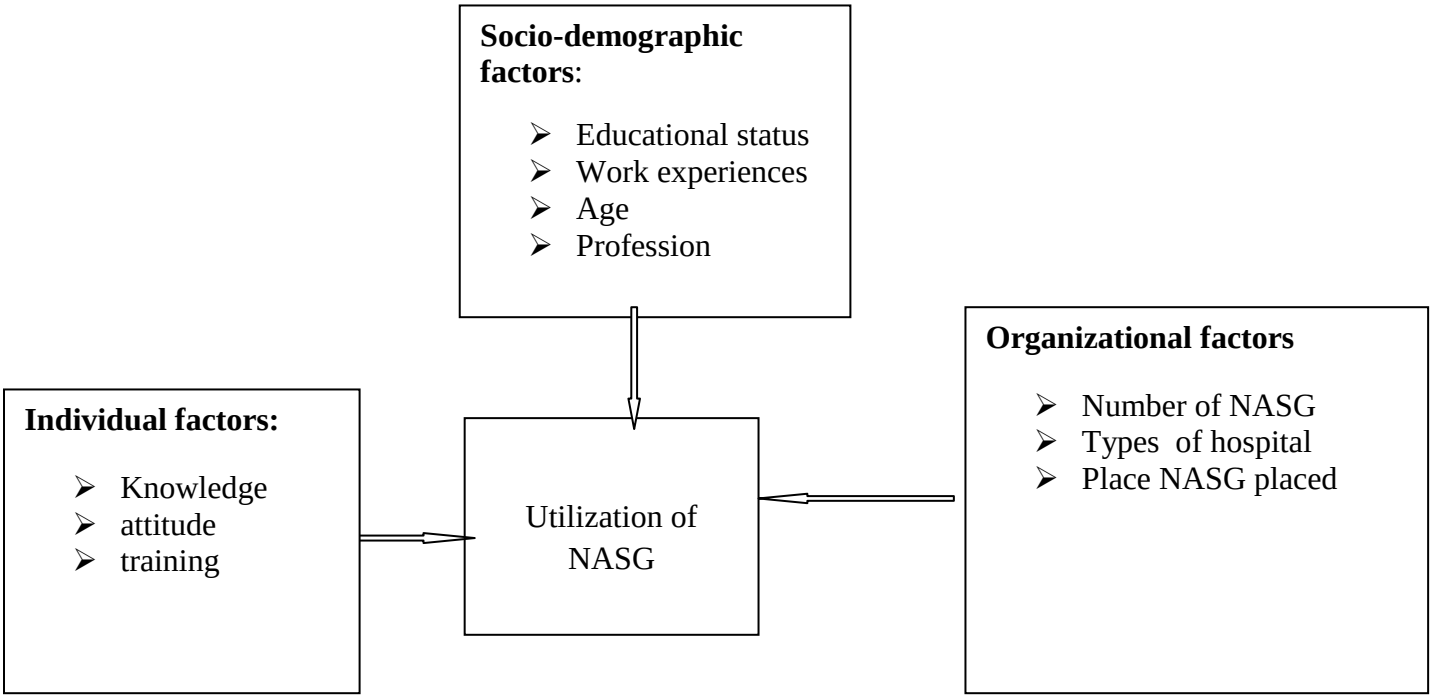


Figure 1 Conceptual framework on utilization NASG for the management of PPH by health care professionals (22- 27)

CHAPTER THREE-OBJECTIVES

3.1 General objective

To assess utilization of non-pneumatic anti-shock garment for the management of postpartum hemorrhage and associated factors among health Care professionals who were working in public hospitals of Jimma Zone, South West Ethiopia, 2019

3.2 Specific objectives

1. To assess Health care professionals utilization of non-pneumatic anti-shock garment for the management of postpartum hemorrhage.
2. To identify factors associated with utilization of non-pneumatic anti-shock garment for the management of postpartum hemorrhage among health care professionals.

CHAPTER FOUR -METHODS AND MATERIALS

4.1 Study Area and the Study Period

The study was conducted in Jimma zone public hospitals, Oromia regional state south-West Ethiopia. Jimma zone far 350 Km from Addis Abbaba. The zone has a total area of 119,316 Square kilo meters. It has 21 woreda and 1 town administration with a total of 555 kebeles of which 515 of them are rural and 30 are urban. The population projection of 2014/15 of the zone is 3090112 with total reproductive age groups of 616380.

In this zone there were seven public hospitals: Jimma medical center, Shanan Gibe hospital, Agaro Hospital, Limmu Hospital, Seka Hospital, Omo Nada Hospital and Satama Hospital. The study was conducted from April 01 to, 20 2019.

4.2 Study design

Facility based cross-sectional study design both quantitative and qualitative methods were employed.

4.3 Population

4.3.1 Source population

All health care professionals' who were working in seven Jimma Zone public Hospitals.

4.3.2 Study population

All health care professionals who were working in seven Jimma Zone public Hospitals and fulfilled the selection criteria.

4.4 Selection criterion

4.4.1 Inclusion criterion

All certified staffs (midwife, physician, nurse, emergency surgery**)** in the labour and delivery wards working by shift, regular bases and in night duty and willing to participate were included.

4.4.2 Exclusion criterion

Health care professionals who were on annual leave during the study period were excluded.

4.5 Sample size determination and procedure

The study included a total of 210 included by census sampling technique in quantitative study. An in-depth interview was conducted on 10 key informants in qualitative. These health care professionals were chosen purposively based on their involvement in the used of NASG. Participants who participated in in-depth interview were not involved in quantitative study.

Sr.No	Name hospitals	No of Healh professionals
1.	Jimma Medical Center	70
2.	Shenen Gibe hospital	32
3.	Seka Hospital	22
4.	Omo Nada Hospital	20
5.	Limmu Hospital	23
6.	Agaro Hospital	33
7.	Satama Hospital	20
	Total	220

4.6 Study Variables

Dependent variable

- ✓ Utilization of non-pneumatic anti-shock garment

Independent variable

- ❖ social demographic characterizes: (work experiences, educational status, age, sex, region, professions, ethinicity)
- ❖ Knowledge
- ❖ Attitude
- ❖ Organizational related variables

4.6 . Operational Definitions and Definitions of terms

Utilization of Non-pneumatic anti-shock garment (NAG):
Measured based on the response to the question whether health care professionals used NASG for the management of postpartum hemorrhage at least one time (22,24).

Health care professionals: Midwives, Physicians, obstetricians, Nurses, emergency surgery those provide care for women during labour and delivery, postnatal ward were considered as health care professionals.

Knowledge scale: There were eighteen knowledge questions. The maximum score is 18 and the minimum score is zero. The respondents score of total knowledge questions those who scored nine and above out of 18 or the percentage score was 50% and above have good knowledge and below 50.0% graded as having poor knowledge (**26**).

Attitude scale: There were a total of eight attitude questions. The question of attitude given 3 for agrees, 2 for neutral and 1 for disagree. The value was reversed for negative questions. The maximum score was 24 and the minimum score was 8. The attitude was considered "Positive" if the score was 12 and above out of 24 or the percentage score was 50% and above and "Negative" if less than 50 %(27).

4.7 Measurements and Data Collection Procedure

Aself-administered semi- structured questionnaire was used to collect data from study participants. The instrument was adapted and developed from different literatures [22-25,27]. It was prepered in English version and the questionnaire contains four parts which include socio demographic status eight questions, knowledge of Non-pneumatic anti-shock garment eight questions , attitude of health care professional regarding Non- pneumatic anti-shock garment eight questions and the responses consist five likert scales which were strongly agree, agree ,neutral, disagree and strongly disagree. The five likert scale for analysis was become three likert scale. Strongly agree and agree became agree and disagree and strongly disagree became disagree and neutral. Before the actual data collection, the questionnaire was pre-tested on 10% of the total samples that is on 22 health care professionals in Metu Karl Hospitals and appropriate corrections were made such as logical order of some questions, some words difficult to understand were revised. The overall standardized cronbach's alpha for internal consistent or the reliability score of measurement was 0.86.

In-depth interview was carried out by the principal investigator and note taker on who agreed to be interviewed.

4.8 Data quality control

Data quality was controlled by pretest on 10% of the sample health care professionals at Metu karl Hospital. One full day traning was given for data facilitatiories and supervisors regarding the study, the questionnaire and data collection procedure by the principal investigator. The collected data were checked for its completeness and faced problems was discusssed with data facilitatories and Incomplete data were checked before data entry.

4.9 Data Processing and Analysis Procedure

4.9 1. For Quantitative study

Following the data collection, data were coded, and entered to a computer using Epidata version 3.1 and then exported to SPSS version 23.0 for analysis. Descriptive statistics and binary logistic regressions analysis were performed. In the binary logistic regression, both binary and multivariable analyses were carried out. All the variables were entered into bivariate analysis and those independent variables with a p- value < 0.25 in crude analysis was considered as a candidate for multivariable analysis and those variables with a p value < 0.05 in multivariable analysis were considered as statically significant of non-pneumatic anti-shock garment utilization. Multi-collinearity was checked to see the linear correlation among the independent variables by using the variance inflation factor and standard error. None of the variables yield inflation factor >10 and standard error > 2 (VIF<4.66 and Std.E < .137) and they were not dropped from multivariable analyses. Hosmer and Lemeshow's test was found to be insignificant (p-value =0.158) and Omnibus test was significant (p-value = 0.000) which indicate that the model was fitted. Finally, the result of the analysis was presented in texts, tables and graphs as appropriate.

4.9.2. For qualitative study:

For qualitative study, first individual, tapes recorded were transcribed and then translation. The data was coded by number then similar number pooled together. Finally presented in narratives & used to support the quantitative results.

4.10 Ethical considerations

Before data collection, ethical clearance was obtained from the institutional review board of Jimma University, Institute of health and submitted to each hospital. Permission was obtained from each hospital prior to data collection. The written consent was obtained from each

participant that participation was voluntary and they have the right to withdraw at any time from the study. The informed consent was comprised the study purpose and procedures, potential risks and benefits, voluntary participation and right of withdrawal, the information provided by each respondent was kept strictly confidential

4.11 Dissemination of findings

The result of the study will be disseminated to Jimma University, Institute of health, school of Nursing and Midwifery, Jimma Zone Health Bereau and concerned bodies in the study area. Finally, it will be made ready for publication on local or international journals

CHAPTER FIVE - RESULTS

5.1 Socio demographic characteristics

A total of 220 questionnaires were distributed to the participants but only 210 were replied; the rest 10 did not fill the questionnaire correctly and excluded from the analysis with response rate of 95.5%.

The mean age of the respondents was 28.36 years. Half of participants 106(50.5%) were in the age group of 25-29. Among the respondents, 121 (57.6%) were male. Nearly (51.9%) of respondents were married. Majority of them were Oromo by ethnicity (70.0%). Eighty six (41.0%) were Muslim by religion. Professionally 145(69.0%) were Midwives. One hundred forty eight (70.5%) had 1 -5 years of work experiences (Table 1).

Table 1: Socio-demographic characteristics of health care professional who were working in Jimma Zone Publc Hospitals South West Ethiopia, April 2019.

Variables	Frequency	Percentage
Age in years		
20-24	39	18.6
25-29	106	50.5
30-34	41	19.5
35-39	24	11.4
Sex		
Male	121	57.6
Female	89	42.4
Marital status		
Married	109	51.9
Single	101	48.1
Ethnicity		
Oromo	147	70.0
Amhara	33	15.7
Tigrai	14	6.7
Gurage	9	4.23
Others	7	3.33
Religion status		
Muslim	86	41.0
Orthodox	77	36.7
Protestant	41	19.5
Others	6	2.9
Profession		
Midwives	145	69.0
Nurses	46	21.9
Medical doctor	5	2.4
Emergency surgery	14	6.7
Educational level		
Diploma	50	23.7
Bachelor degree	142	67.6
Masters	14	6.7
Specialist	4	1.9
Years of experience		
1-5 years	148	70.5
6-10 years	55	26.2
11 years and above	7	3.3

Other: Ethnicity: Wolayita, Hadiya, Silte, Kafa

Religion: Wakefata, Catholic.

5.2 Respondents' Knowledge of Non-pneumatic Anti-Shock Garment:

This study indicated that, majority (80.0%) of respondents had heard about non-pneumatic anti-shock garment while 42 (20.0%) never heard before. Ninety one of the respondents heard from hospital (54.2. %). Ninety eight (58.3%) of the respondents said that non-pneumatic anti-shock looks like trousers and 55(32.7%) said bottom half of suit. Ninety seven (57.7%) of the respondents correctly mentioned that non-pneumatic anti-shock garment has six parts. Regarding the function of Non-pneumatic anti-shock garment, 21.0% mentioned that non-pneumatic anti-shock garment increases blood flow to vital organs. Concerning the criteria for the application of non-pneumatic anti-shock garment for women with postpartum hemorrhage about 98(36.8%) said NASG applied when blood loss was greater than 750ml , 59.5% had good knowledge (Table 2).

This finding was supported by qualitative finding. For instance:-

….A 26 years old of health care provider said that *"the non-pneumatic anti-shock garment is cloth applied for woman with postpartum hemorrhage complication. It is very effective for reverse of the postnatal women already in shock and stabilizes her condition within short period. Its application is not time consuming and the application started from her legs."* Similarly supported by:-

…Another 32 years old of health care professionals working at labour ward said *that I have applied the non-pneumatic anti-shock garment for postpartum hemorrhage women three times. I have used for women already in obstetric shock, and severe vaginal bleeding. Before non-pneumatic anti-shock garment, when woman in an unstable condition I felt very nervous that she would not survive. After ten minutes of I have applied non-pneumatic anti-shock garment, her condition was improved and the bleeding decreased. After that I was Happy and started my next procedure for her.*

Table 2: Knowledge NASG among health care professionals who were working in Jimma Zone Public Hospitals South West Ethiopia, April 2019.

Variables	Frequency	Percentage
Known NASG as it used for pph complication mgt		
Yes	168	80.0
No	42	20.0
Source of information(first)		
Training	36	21.4
Conference	6	3.6
Hospital	91	54.2
From textbook	26	15.5
Electronics	4	2.4
Other	5	3.0
NASG look like		
Gown	15	8.9
Trousers	98	58.3
Bottom half of suit	55	32.7
How many parts have the NASG		
Four	39	23.2
Six	97	57.7
Eight	24	14.3
Nine	8	4.8
What is the function NASG? *		
Prevent Shock	97	16.7
Stabilize the women in shock	104	17.9
Reverse shock	54	9.3
Decrease blood loss	98	16.8
Compress blood vessels	91	15.6
Increase blood flow to vital organs	122	21.0
No response	8	1.4
Other	7	1.2
Know proper use of NASG		
Yes	122	72.6
No	46	27.4
Total	168	100.0
Non-pneumatic anti-shock garment applied for women with PPH when.*		
Bleeding >750ml	98	36.8
systolic blood pressure<90 mm	84	31.6
Pulse >110 bpm.	84	31.6

NASG removed when		
Blood loss < 50 ml/hr,	71	21.8
Pulse <100 bpm	88	27.1
Systolic blood pressure >100 mmhg	90	27.7
Normal shock index	76	23.4
	100	59. 5
Good Knowledge	68	40.5
Poor knowledge		

* **Multiple responses are possible**

5.3 Attitudes of Health care professionals Towards Utilization of non-pneumatic anti Shock Garment

Regarding to the attitudes of the respondents towards utilization of NASG for the management of postpartum hemorrhage, about one hundred forty seven (70%) of the respondents agreed that NASG is necessary for the management of postpartum hemorrhage in all settings and 5.7% disagree. One hundred forty two (67.6%) respondents agreed that NASG can used along with standard treatment protocols of postpartum hemorrhage management and 9(4.3%) disagreed. Concerning the time required to apply NASG(Table 3)

Table 3:Attitudes towards NASG utilization among health care professionals who were working in Jimma Zone Publc Hospitals South West Ethiopia, April 2019

Variables	Agree	neutral	Disagree
	No(%)	No(%)	No(%)
The use of non-pneumatic anti shock garment is necessary for the management of postpartum hemorrhage in all settings.	147(70)	49(23.3)	14(6.7)
NASG used along with standard treatment protocols of postpartum hemorrhage.	143(68.1)	55(26.2)	12(5.7)
NASG can be applied with minimum procedures in short period of time.	100(47.6)	55(26.2)	55(26.2)
Removal NASG requires a lot of procedures that takes time.	120(57.1)	40(19.1)	50(23.8)
Anti shock garment is only beneficial to people in the rural areas/primary care settings	28(13.3)	55(26.2)	127(60.5)
Manual removal of placenta is possible with NASG in place	141(67.1)	43(20.5)	26(12.4)
Anti-shock garment is effective in patients with cervical lacerations	104(49.5)	67(31.9)	39(18.6)
The garment should be a must in every health care facility that has maternity service	144(68.6)	35(16.7)	31(14.8)

Regarding the attitudes of respondents towards non-pneumatic anti-shock garment utilization more than half of (53.58%) had positive attitudes (figure2).

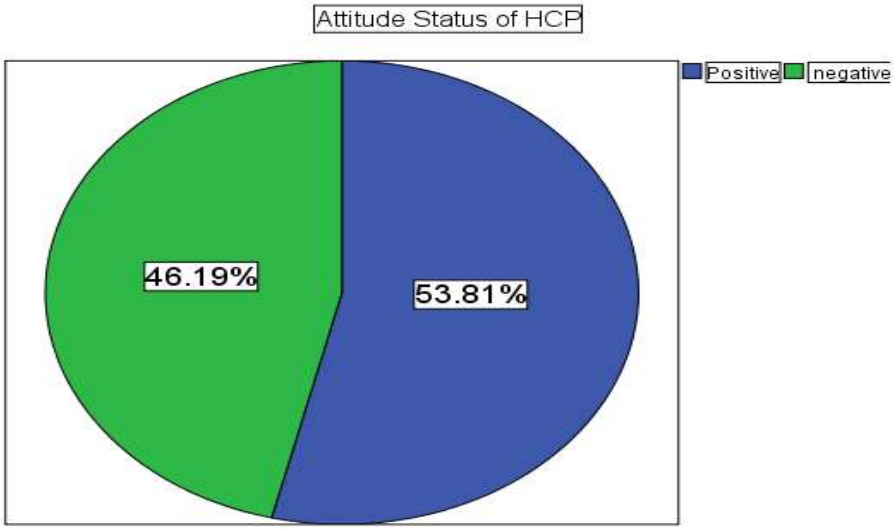


Figure 2: Attitudes towards NASG utilization among health care professionals who were working in Jimma Zone Publc Hospitals South West Ethiopia, April 2019

Concerning to training status on NASG, about fifty nine (28.1%) of the respondents trained on the use of non-pneumatic anti-shock garment for the postpartum hemorrhage management (figure 4).

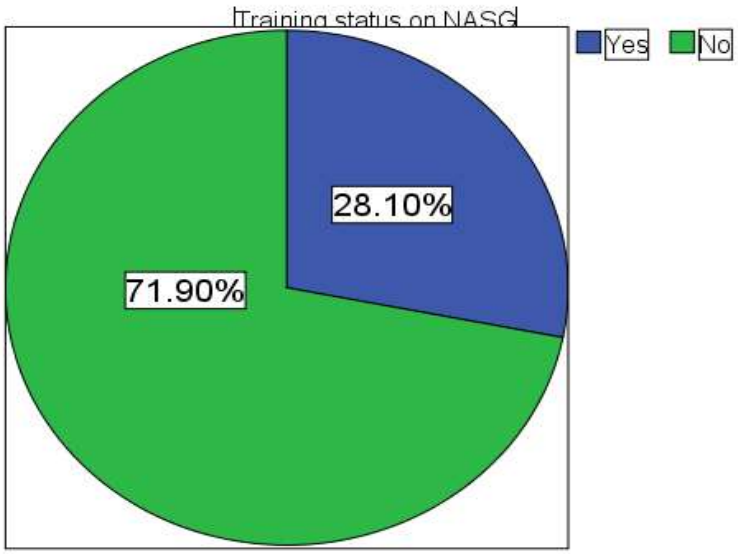


Figure 3: Training status on Non-pneumatic anti-shock garment for postpartum hemorrhage management among Health care professionals who were working in Jimma Zone Public Hospitals, South West Ethiopia, April 2019

5.4. Organizational factors

Concerning the organizational factors, 87(41.4 %%) respondents were working at general hospitals, 126(60%) of the respondents said that their hospitals have two and above number of non-pneumatic anti-shock garment.

Table 4: Organizational factors about utilization of non-pneumatic anti-shock garment by health care professionals who were working in Jimma Zone Public Hospitals South West Ethiopia, April 2019

Variables	Frequency	Percentage
What is the level of your hospital?		
Primary hospital	58	27.6
General hospital	87	41.4
Tertiary hospital	65	31
How many numbers NASG available at your hospital?		
One	84	40
Two and above	126	60
Where does NASG placed after use in your hospital?		
In labour ward	124	59
In not labour ward	86	41

5.5 utilization of non-pneumatic anti-shock garment

Concerning the utilization of NASG by Health Professionals, Seventy six (36.2%) used NASG for postpartum hemorrhage management while 63.8% never applied it for postpartum hemorrhage complication management (figure 5).

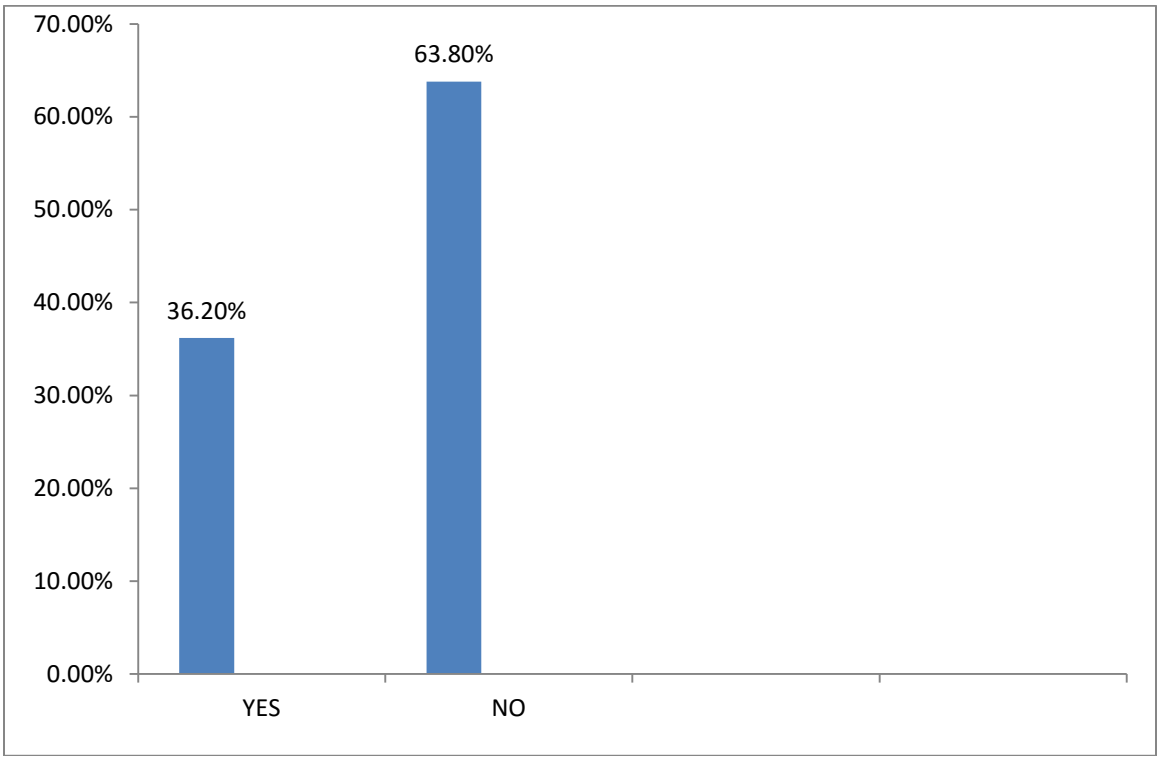


Figure 4: Utilization of Non-pneumatic anti-shock garment among health care professionals who were working in Jimma zone public hospitals, south west Ethiopia, April, 2019

Relating to to the time for non-pneumatic anti-shock garment, from those who used NASG before only 34(15.23%) health care professionals used when every time when there is postpartum hemorrhage. Among those health professionals who never used non-pneumatic anti-shock garment every time if there was PPH, 43(40.2%) used when women already in shock, 41(38.3%) in Severe PPH (table 5).

Table 5: Utilization of non- pneumatic anti-shock garment by health care professionals who were working in Jimma Zone Hospitals South West Ethiopia, April 2019

Variables	Frequency	Percentage
Do you use NASG every time there is PPH?		
Yes	32	15.24
No	43	20.48
Never use	134	63.81
If no, when do you use it?*		
Severe PPH	41	38.3
Shock	43	40.2
When other method is fail	23	21.5
Do you use it, when the need arise in your hospital?		
Yes	62	29.52
No	14	6.67
Never use	134	63.81
If no, why? *		
It is difficult to assemble	10	41.7
It is not ready available for using	9	37.5
I do not know much about it	5	20.8

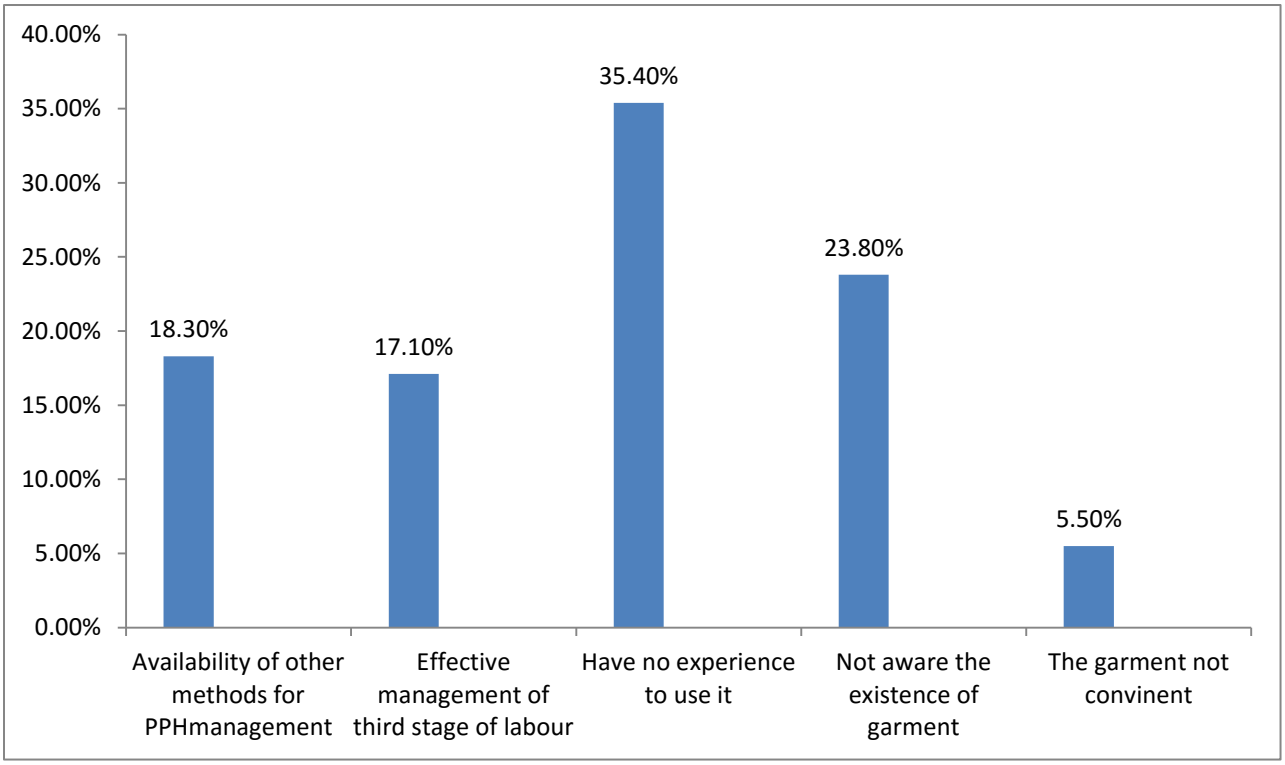
***Multiple responses are possible**

The reasons stated by respondents those did not use non-pneumatic anti-shock garment, (35.4%) were due to lack of experience and (23.8%) due to lack of awareness about availability of the instruments (figure 5).

This finding supported by qualitative finding. For instance:

.... A coordinate of maternity ward from one hospital said, "*the reason for non-utilization of NASG by our staff was because most of our staff has no training and experience on the use of NASG for postpartum hemorrhage women. If there is a woman with postpartum hemorrhage they used other methods like normal saline, blood transfusion."* Similarly it also supported by:

...A 25 years old staff health care provider said that *"I didn't use NASG for the management of PPH complication before because I have no training and experience on its application of non-pneumatic anti-shock garment."*



***Multiple responses are possible**

Figure 5: Reasons not to utilize NASG for the management of post partum haemorrhage Among Health care professionals who were working in Jimma Zone Public Hospitals, South West Ethiopia, April 2019

5.5 Factors associated with utilization of NASG

Factors associated with utilization of NASG both bivariate and multivariable binary logistic regression analysis were made to identify predictors of NASG utilization. The bivariate analysis result revealed that types of professions, educational status, knowledge of respondents, attitude of respondents, training on NASG, types of hospitals, number of NASG and place where placed after use were significantly associated utilization of NASG.

All the significant independent variables in a bivariate analysis were entered together in a multivariable logistic regression using backward method to determine final predictors of utilization of non-pneumatic anti-shock garment controlling for potential confounders. Accordingly; knowledge level, attitude, having training on NASG, number of NASGs hospitals have were independent predictors of utilization of non-pneumatic anti-shock garments. In this study health care professionals who had a good knowledge about NASG were 3.957 times more likely to use the NASG as compared to health professionals who had poor knowledge about NASG[AOR=3.957, 95% CI:(1.67, 9.407, p=0.002)].

This finding supported by qualitative finding. For instance*:*

A health care provider working at labour ward explained NASG as, *I have used NASG for the management of postpartum hemorrhage many times. NASG is not a drug but it is cloth used for postpartum hemorrhage management. It stabilizes woman in shock, increase blood flow to vital organ and decrease blood loss. It is not simple removed after applied. To remove it there is a rule called rule of 20 after measuring the vital sign blood pressure and pulse in normal range at least for two hours then each segment should be removed every 15 minutes starting from segment one to six. If the vital sign changes by **20** in between removing means pulse increased by 20 bpm and BP decreased by 20 mmhg, the NASG should be reapplied.*

Regarding the attitudes of health care professionals those who had positive attitude toward the NASG utilization were 3.54 times more likely to use NASG than those who had negative attitude towards NASG utilization for postpartum hemorrhage management [(AOR= 3.54, 95% CI:(1. 37, 9.13, p= 0.009)].

…. Staff working at labour said that*"I have the knowledge of the non-pneumatic anti-shock garment as it used for postpartum hemorrhage to reverse shock and stabilize the women*

condition but I didn't use it because I preferred other methods like normal saline, warm cloth and blood transfusion for woman with postpartum haemrrahge."

Concerned with status of training by health care professionals on NASG use , those health professionals who received training on the use of NASG were 13.156 times more likely use NASG as compared with who didn't received training on NASG use (AOR: 13.156, 95% CI:(4.89, 36.00, p=0.0001)]. This is supported by qualitative finding. For instance:

…A 25 years old health professional said that *"I didn't use NASG for the management of postpartum hemorrhage complication before because I have no training and experience how to use it. If I receive training I use it without any difficult because I have seen the health professionals who were trained can apply and remove easily."*

Relating to NASG, those health care professional whose hospitals had two and above NASGs, were 8.7 times more likely to use NASGs as compared with those health professionals' hospital had only one NASG for postpartum hemorrhage management of complication (AOR: 8.70, 95% CI: (2.89 , 26.20, p=0.0001)](Table 6).

This finding was supported by qualitative finding. For instance:

….A 32 year head of maternity ward said that, *previous we have three non-pneumatic anti-shock garments that our staffs applied for the mothers who have postpartum haemorrhage. But now there is only one NASG at our hospital and the others were referred mother to referral hospital by NASG that they never gave back for us and left there. Currently we rarely used NAG because when NASG we have applied for the mother and other presented with similar case we never applied it because we have only one and also before the NASG is cleaned we never use it that mother presented without NASG.*

Table 6: Multivariable logistic regression showing independent factors of utilization of non-pneumatic anti-shock garment among health care professionals working in Jimma Zone Public Hospitals South West Ethiopia, April, 2019

Variables	Categories	Utilized NASG		COR (95%CI)	AOR (95%CI)	
		Yes	No			
		N (%)	N(%)			p- value
General	Good knowledge	61(36.31%)	39(23.21%)	5.53(2.74, 11.13)	3.967(1.67, 9.407)	0.002
Knowledge	Poor knowledge	15(8.93%)	53(31.55%)	1.0	1.0	
Total Attitude	positive attitude	66(31.4%)	47(22.4%)	12.212(5.75, 25.96)	3.540(1.37, 9.13)	0.009
	Negative attitude	10(4.8%)	87(41.4%)	1.0	1.0	
Training status	Yes	47(22.4%)	12(5.7%)	16.477(7.77, 34.96)	13.156(4.81, 36.00)	0.0001
	No	29(19.21%)	122(80.79%)	1.0	1.0	
NASG number	One	13(6.2%)	71(33.8%)	1.0	1.0	
	Two and above	63(30%)	63(30%)	5.461(2.75, 10.85)	8.70(2.89 , 26.20)	0.0001

CHAPTER SIX -DISCUSSION

Non-pneumatic anti-shock garment (NASG) can prevent the postpartum hemorrhage complication by decreasing blood flow to the lower extremities and increasing blood flow to vital organs like brain, heart, lung.

Based on this finding 36.2% of the respondents utilized the non-pneumatic anti-shock garment on the client for the management of postpartum hemorrhage. This finding was almost similar finding in Ibadan Nigeria and Sokoto State Specialist Hospital (35%) in both study areas (24,25). How every it was higher when compared with study done in Ondo state Nigeria that 14.1% of respondents' utilized non-pneumatic anti-shock garment for postpartum hemorrhage management (22). The difference may be due sample size difference, sampling technique used. On the contrary it was lower compared to finding in Bayelsa State Nigeria and Benin Central Hospital that 46.4% and 42% of the respondents used non-pneumatic anti-shock garment for postpartum hemorrhage management respectively (23,26). The slight difference in utilization might be due to difference between study participants in which only Midwives participated in case of study conducted in both study areas and also may be due to variation in sampling technique used.

The other finding in this study factors that significantly associated with utilization of non-pneumatic anti-shock garment were identified. Accordingly, knowledge, attitude, non-pneumatic anti-shock garment number and training status of the respondents and their utilization of NASG with P-value <0.05.

Good utilization of non-pneumatic anti-shock garment was seen among health care professionals who had good knowledge about NASG. Those who have good knowledge utilize non-pneumatic anti-shock garment about four times more likely as compared to having poor knowledge. This implies that good knowledge exerts a positive effect on the extent of health care professionals' utilization of NASG. This is supported by the study conducted in Ondo State and Benin Central Hospital, that there was association between respondents' knowledge and their utilization of non-pneumatic anti-shock garment (27,26). This may be due to the fact that good knowledge improves the confidence and readiness of the health care professionals' to utilize NASG for postpartum hemorrhage management and increase their ability to use it appropriately. However it was differ from Bayelsa State Nigeria that there was no significant association between respondents' knowledge and their utilization of non-pneumatic anti-shock garment (23). The

discrepancy may be due the difference of sample size, this study included different types of health care professionals.

Another independent factor showed that there was more utilization of NASG for postpartum haemorrhage management among health care professionals who had positive attitude. This implies that a positive attitude regarding NASG exerts a positive effect on the extent of health care professionals' NASG utilization practice. Health care professionals' have positive attitude there is a big tendency to utilize properly. It is different from the study finding in Bayelsa State Nigeria that there is no association between respondents' attitude and non-pneumatic anti-shock garment utilization (27). This difference may be due to difference in variable categorization, variation in setting from place to place , may be due sampling technique used for sample selection(SRS) and may also due variation in the population participated in the study.

This study showed that good utilization of non-pneumatic anti-shock garment was seen among health care professionals who took training on non-pneumatic anti-shock garment as compared to those who have no training. Those health professionals who trained on non-pneumatic anti-shock were about thirteen times more likely used than those who had no training. This may be due to the fact that attending training can help health care professionals to get more knowledge on how to apply, remove non-pneumatic anti-shock garment and this can improve their utilization of non-pneumatic anti-shock garment.

In this study non-pneumatic anti-shock garment number was other factor that statically associated with utilization of non-pneumatic anti shock garment by health care professionals. Hospitals having two and above non-pneumatic anti-shock garment were around nine times more likely used than those who have one.

Health care professionals play a vital role in the reduction of maternal mortality and morbidity in all health facilities. Postpartum haemorrhage is one of the leading causes of maternal mortality especially in the developing countries. It is therefore, important that health care providers are always abreast with current techniques and equipments used in preventing and management of postpartum haemorrhage. This study showed low utilization of non-pneumatic anti shock garment among the health care providers, and this important concept included in maternal health program and policy planners.

Strengths of the study

- ♣ The study involved both quantitative and qualitative methods of data collections to maximize the reliability of the data collected.

Limitation of the study

- ♣ The questionnaire was prone to social desirability bias; hence it assesses self-reported regarding utilization of NASG, there might be over-reporting of a behavior.
- ♣ Recall bias was there because the majority of the health care professionals were asked about their past utilization of NASG.
- ♣ In addition to these, the lack study in Ethiopia and adequate studies done out of Ethiopia on this topic make comparison and discussion difficult.

CHAPTER SEVEN_-CONCLUSION AND RECOMMENDATION

7.1 Conclusion

This study showed that of the respondents' utilized non-pneumatic anti shock garment for the management of post partum hemorrhage low. The study also identified factors associated utilization of non-pneumatic anti-shock garment. The independent factors associated with utilization of non-pneumatic anti-shock garment were having good knowledge of health professional; attend training on non-pneumatic anti-shock garment, positive attitudes towards non-pneumatic anti-shock garment utilization and more number of non-pneumatic anti-shock garment available.

7.2 Recommendation

Based on the study findings the following recommendations are suggested:

To Hospitals

1) All Hospitals should include non-pneumonic anti-shock garment as a management protocol for post-partum hemorrhage.
2) Periodic training for health professionals on the use of non-pneumonic anti-shock garment for management of obstetric hemorrhage.
3) The non-pneumonic anti-shock garment in all Hospitals should be placed in area where all staffs easily get it for application.

To Health Care Providers and Counselors

Health care professionals who are rendering in maternity at one time so those took training and have experience for using it should share their experience for other health care providers.

To Federal ministry of Health

Adding NASG training to pre-service curricula for new Midwives, Nurses, doctors, and other skilled maternal health care workers, who will arrive at their new posts already possessing skills and confidence in NASG application, management, and removal.

To Researchers

Further studies which include variables not considered like guideline of NASG, functionality of NASG in this study are recommended.

REFERENCES

1. The WHO has recommended using NASG to help reduce maternal deaths in settings where definitive care is not immediately available and is included in WHO's Breakthrough Innovations that Can Save Women and Children Now.
2. Miller S, Bergel EF, El Ayadi AK, et al. Non-Pneumatic Anti-Shock Garment (NASG), a first-aid device to decrease maternal mortality from obstetric hemorrhage: a cluster randomized trial, PLOS One, 2013 8(10):764 - 677.
3. Hensleigh PA Anti-shock garment provides resuscitation and haemostasis for obstetric haemorrhage. BJOG 2002,109: 1377–1384.
4. Miller S, Martin HB, Morris JL. Anti-shock garment in postpartum haemorrhage. Best practice & research Clinical obstetrics & gynaecology, 2008, 22(6):1057-1074.
5. SUELLEN MILLER Introduction to NASG safemotherhood.ucsf.edu IND LEARNER | FACILITY | © 2013
6. ICM/FIGO. International Confederation of Midwives and International Federation of Gynaecologists and Obstetricians Joint Statement: Management of the Third Stage of Labour to Prevent Post-partum Haemorrhage 2003.
7. World Health Organization. WHO recommendations for the prevention and treatment of postpartum haemorrhage. Geneva: World Health Organization; 2012. Available from: http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/9789241548502/en/.
8. Demeke, Z. Non-Pneumatic Anti-Shock Garment pilot in Ethiopia to reduce maternal mortality secondary to obstetric hemorrhage. CHAI Ethiopia. Presented at the Global Maternal Health Conference January, 2013.
9. WHO Health statistics and information system maternal mortality ratio definitions. Retrieved 2017: Available from**: http://www.who.int/healthinfo/statistics/indmaternal mortality/en/**
10. World Health Organization, UNICEF, United Nations Population Fund (UNFPA). Managing complications in pregnancy and childbirth: a guide for midwives and doctors. 2nd ed. Geneva: World Health Organization; 2017.
11. World Health Organization Maternal mortality https://www.who.int › News › Fact sheets › Detail 2018

12. Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group Lancet 2016 Jan 30;387(10017):462-74..
13. Maternal death or maternal mortalities defined by world health organization (WHO) as "the ….All data is from the world Bank. …. Retrieved 2018-06-27. Available from: https://www.google.com/search?q=List+of+countries+by+maternal+mortality+rate
14. DC Dutta's Textbook of Obstetrics: Kolkata India, eighth edition 2015. Available from: https://www.academia.edu/36303073/Textbook_of_DC_Duttas_OBSTETRICS_8ed.
15. Lale Say, Doris Chou, Alison Gemmill, Özge Tunçalp, Ann-Beth Moller, Jane Daniels, A Metin Gülmezoglu, Global causes of maternal death: a WHO systematic www.thelancet.com/lancetgh June 2014 Vol 2
16. Legesse et al Trend of maternal deaths from 2010 to 2014 in JUSH International Journal of Women's Health 2017:9
17. Abete T,Kebede BMisganaw, E, RogersN, Retrospectivestudy of birth outcome and prevalence postpartum morbidity among women who attendend for care in Gonder,North West Ethiopia j.androl ,2014; 3(125)
18. WHO Managing Complications in Pregnancy and Childbirth: A guide for midwives and doctors. Integrated Management of Pregnancy and Childbirth (IMPAC) Geneva: WHO, Department of Reproductive Health and Research 22, 2000
19. Effectiveness of Non-Pneumatic Anti-Shock Garment (NASG) in Preventing Shock-related Morbidity and Mortality in Severe Hemorrhagic Shock. Crit Care Obst Gyne. 2017;3:3.
20. Laine J. The non-pneumatic anti-shock garment, a first aid device in obstetrical emergencies, 2017.
21. Pileggi-Castro C, Nogueira-Pileggi V, Tunçalp Ö, Oladapo OT, Vogel JP, Souza JP. Non-pneumatic anti-shock garment for improving maternal survival following severe postpartum haemorrhage: a systematic review. Reproductive Health. 2015 Dec;12(1):28
22. Ohaeri BM. Assessment of Utilization of Non-Pneumatic Anti Shock Garment (NASG) in the Control of Post-Partum Hemorrhage among Midwives in Selected Hospitals in Ondo-State, Nigeria. International Journal of Caring Sciences. 2017;10(1):327
23. Onasoga OA, Duke E, Danide IU, Jack-Ide IO. Midwives' knowledge and utilization of non pneumatic anti shock garment in reducing complication of postpartum hemorrhage is

selected health care facilties in Bayelsa state Nigeria. IntJ Reproductive contraceptive Obstet Gynecol 2015;977-981

24. Kolade OA, Tijjani WA, Oladeji MA, Ajibade LA. Midwives' knowledge and utilization of anti shock garment in prevention of postpartum haemorrhage shock at the university college hospital, Ibadan Nigeria. J Nurs Health Sci. 2014;3:9-16.
25. Kombo SA, Shehu SB, Farooq MA, Yunusa A. Knowledge and Utilization of Antishock Garment in Prevention of Pospartum Haemorrhagic Shock in Specialist Hospital Sokoto, Sokoto State Nigeria DUJOPAS 4(2): 236 -244, 2018
26. Enuku ca, Adeyemo fo. Knowledge and use of anti-shock garment among midwives in central hospital, Benin City, Edo state. Lautech journal of Nursing. 2018:23
27. OGBEYE GB, OHAERI BM, OLATUBI MI. Midwives knowledge and attitude towards the use of anti-shock garment in the control of post partum hemorrhage in selected hospitals in Ondo state. Int J Health Sci Res. 2015; 5(9):389-395.
28. Kerr, N. L., Hauswald, M., Tamrakar, S. R., Wachter,,D. A., & Baty, G. M. An inexpensiedev ice to treat postpartum haemorrhage: apreliminary proof of concept study of h ealtprovider opinion and training in Nepal. *BMCPregnancy and Childbirth*, 2014. *14*(81).

Annex I Questionnaire

Information sheet

Read the statements

My name is …… I am a data collector at study conducted **utilization of non-pneumatic anti-shock garment for management of postpartum hemorrhage and its associated factors among health professional working in public Hospitals Jimma zone .**

Purpose of the research: This study is aimed to assess Utilization of non-pneumatic anti-shock garment for management of postpartum hemorrhage and its associated factors among Health professional working in Jimma zone Hospitals.

Procedure: In order to collect my data, I invite you to take part.

Risk and /or discomfort: By participating in this research you may feel some discomfort especially on sacrificing your time otherwise, no risk in participating in this research, so your response provide an important input to show the gap and means to improve maternal health service.

Benefits: If you will be participating in this research, the output of the study will have both direct and indirect benefit to you

Incentives/payments for participating: You will not be provided any incentives or payment to take part in this research.

Confidentiality: The information collected from this research project will be kept confidential and information about you that was collected by this study will be stored in a file, without your name, but a code number assigned to it.

Right to refusal or withdraw: You have the full right to refuse from participating in this research.

Person to contact: If you want to know more information, you can contact;

With due understanding of the mentioned information, are you willing to participate in the study?

Yes

Signature of the participant----------date----------

Consent form

The above information above regarding my participation in the study has been made clear to me. I have been given a chance to ask questions which, have been answered to my satisfaction. I am voluntarily participating in this study. I understand that my records will be kept private and that I can leave the study at any time. I understand that I my participation don't affect me

If you agree to participate, put your signature bellow

Signature _____ date _____

PART I socio-demographic characteristics

This section asks about your socio-demographic and other relevant information.

Instruction: Read the questions carefully and encircle your choice and fill the black space for the questions which have no alternative.

S.no	**Variables**	**Responses**
101	Sex	1.Male 2.Female
102	Age in years	_____
103	Marital status	1.Married 2.Single 3.Divorced 4. Widow
104	Ethnicity	1. Oromo 2. Amhara 3. Tigrai 4. Gurage 5. Other (specify)…
105	Religion status	1.Orthodox 2.Muslim 3.Protestant 4. Other(specify)……
106	Profession	1. midwife 2. Nurse 3. Medical Doctor 4. Emergency surgery
107	Educational level	1. Diploma 2. Degree 3. Masters 4. Specialist
108	Years of work experience	_____

PART II: Respondents Knowledge about NASG

This section asks about your knowledge regarding Non-pneumatic anti-shock garment.

Instruction : Read the questions carefully and encircle your choice

S.N	Variables	Responses	
201	Do know NASG as it is PPH complication management?	1. Yes 2. No	
202	If yes, from where you know it first?	1. Training 2. Conference 3. Hospital 4. From textbook 5. Electronics 6. Other (specify)….	
203	What it looks like?	1. Gown 2. Trousers 3. Bottom half of suit	
204	How many parts NASG have?	1. Four 2. six 3. eight 4. nine	
205	What is the function of NASG? (**more than one answers possible**)	1. prevent shock 2. stabilize the women in shock 3. reverse shock 4. decrease blood loss 5. compress blood vessels 6. increase blood flow to vital organs 7. I don't know 8. Other specify(_____)	
206	Do you know how to use the NASG ?	1. Yes 2. No	
207	Do you know the criteria of NASG use?(**more than one answers possible**)	1. Bleeding >750ml 2. systolic blood pressure <90 mm 3. Pulse >110 bpm.	

208	NASG removed when(**more than one answers possible)**	1) blood loss < 50 ml/hr, 2) pulse <100 bpm 3) systolic blood pressure >100 mmhg 4) Normal shock index	

Part III: Respondents attitude towards NASG utilization

Instruction: Read the statements carefully and encircle your choice..

	Statement	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
301	The use of non-pneumatic anti shock garment is necessary for the management of postpartum hemorrhage in all settings.	**5**	**4**	**3**	**2**	**1**
302	NASG used along with standard treatment protocols of postpartum hemorrhage.	**5**	**4**	**3**	**2**	**1**
303	NASG can be applied with minimum within short period of time.	**5**	**4**	**3**	**2**	**1**
304	Removal NASG requires a lot of procedures that takes time.	**5**	**4**	**3**	**2**	**1**
305	Anti shock garment is only beneficial for people in the rural areas/primary care settings	**5**	**4**	**3**	**2**	**1**
306	Manual removal of placenta was possible while NASG in place.	**5**	**4**	**3**	**2**	**1**
307	Anti-shock garment is effective in patients with cervical lacerations	**5**	**4**	**3**	**2**	**1**
208	The garment should be a must in every health care facility that has maternity service	**5**	**4**	**3**	**2**	**1**

Part IV: Organizational related questions

This section asks about your institution regarding the NASG and other relevant information.

Instruction : Read the questions carefully and encircle your choice.

	Variable s	Reponses
401	What is the level of your hospital?	1. Primary hospital 2. General hospital 3. Tertiary hospital
402	How many numbers of NASG available at your hospital?	1. One 2. Two 3. Three and above
403	Where your NASG is placed after use?	1) In labour ward 2) In store room

PART V: - Utilization of Non-pneumatic anti shock garment

This section asks about your utilization NASG and other relevant information.

Instruction : Read the questions carefully and encircle your choice

S.No	Variables	Responses	Skip
501	Having been trained on the use of NASG?.	1. Yes 2. No	
502	Have you ever used NASG for the management of postpartum hemorrhage complications?	1. Yes 2. No	If no →407
503	Do you use NASG every time there is PPH?	1. Yes 2. No	
504	If no on Q 406, when do you use it? (**more than one answers possible)**	1. Severe PPH 2. Shock 3. When other method is fail	
505	Do you use it, when the need arise in your hospital?	1. Yes 2. No	

506	If no why? (**more than one answers possible)**	1. It is difficult to assemble 2. It is not readily available 3. I do not know much about it	
407	Why didn't use NASG for the management of post partum hemorrhage complication? (**more than one answers possible)**	1. Availability of other ways of treating PPH 2. Effective management of 3rd stage of labour 3. I have no experience on the use of NASG 4. I'm not aware of the NASGexistence 5. The garment is not convenient	

II. Check lists for in-depth interview

1. Can you explain about NASG utilization in your hospital? (Probe- your understanding on (function of NASG, Application?)
2. For which condition you apply NASG in your Hospital? (Probe.. Tell me your experience on application of NASG?)
3. Can you explain the perception of staffs in your hospital toward the utilization of NASG?
4. Can you tell me when to remove NASG?
5. Can you tell me things that factors affecting to utilize NASG in your Hospital? (Probe- training, availability of adequate NASG, management issues, NASG….)